

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A thermal processing apparatus comprising:

a heating assembly adapted to support a wafer for processing;

a cooling assembly;

~~located such that a thermal conductance region is provided~~ a gap disposed between
said heating assembly and said cooling assembly, said gap having a cross-section profile with
a first vertical dimension in a first region that is substantially different than a second vertical
dimension in a second region; and

a device configured to adjust a thermal conductance of said ~~thermal conductance~~
~~region gap~~.

Claim 2 (Original): The apparatus according to Claim 1, wherein said heating assembly comprises a heating body and an electrical resistive element attached to said heating body.

Claim 3 (Original): The apparatus according to Claim 1, wherein said cooling assembly comprises a cooling body, a fluid path within said cooling body, and a feed device configured to feed cooling fluid along said fluid path.

Claim 4 (Original): The apparatus according to Claim 1, wherein said device comprises a body having a recess configured to define at least a portion of a chamber configured to receive a working fluid, and a fluid injection system configured to inject a working fluid within said chamber.

Claim 5 (Original): The apparatus according to Claim 4, wherein said device further comprises a control system configured to control said fluid injection system to achieve at least one of a predetermined density and a predetermined pressure of working fluid within said chamber.

Claim 6 (Original): The apparatus according to Claim 5, wherein said device includes a pressure regulator, said control system being configured to control said pressure regulator.

Claim 7 (Original): The apparatus according to Claim 4, wherein said injection system includes a gas supply configured to inject helium gas within said chamber as the working fluid.

Claim 8 (Original): The apparatus according to Claim 7, wherein said injection system includes an additional gas supply configured to inject a second gas within said chamber as the working fluid.

Claim 9 (Original): The apparatus according to Claim 4, wherein said device further comprises a vacuum pump configured to evacuate said chamber.

Claim 10 (Original): The apparatus according to Claim 4, wherein said recess has an aperture, said aperture abutting said heating assembly to define said chamber.

Claim 11 (Original): The apparatus according to Claim 4, wherein said recess has a platinum coating.

Claim 12 (Original): The apparatus according to Claim 4, wherein said recess has a membrane therein defining separate sections within said chamber.

Claim 13 (Original): The apparatus according to Claim 12, wherein said membrane is in a form of a honeycomb.

Claim 14 (Original): The apparatus according to Claim 12, wherein said membrane is in a form of ribs.

Claim 15 (Original): The apparatus according to Claim 4, wherein said recess has a side wall and a base, said side wall abutting said heating assembly such that said heating assembly, said side wall, and said base define said chamber, said base being spaced apart from said heating assembly by a gap distance, said base being configured such that the gap distance varies over said base.

Claim 16 (Original): The apparatus according to Claim 1, wherein:
said heating assembly comprises a heating body and an electrical resistive element attached to said heating body;
said cooling assembly comprises a cooling body, a fluid path within said cooling body, and a feed device configured to feed cooling fluid along said fluid path;
said device comprises a body having a recess configured to define at least a portion of a chamber configured to receive a working fluid, and a fluid injection system configured to inject a working fluid within said chamber; and
said heating assembly and said cooling assembly are mounted on a pedestal, said pedestal having a first conduit extending therethrough and configured to receive power

supply wires for said electrical resistive element, said pedestal having a second conduit extending therethrough and configured to act as a supply line for said fluid path, said pedestal having a third conduit extending therethrough and configured to act as a discharge line for said fluid path, said pedestal having a fourth conduit extending therethrough and configured to act as a feed line for said chamber.

Claim 17 (Original): The apparatus according to Claim 16, wherein:

said recess has a membrane therein defining separate sections within said chamber;

and

said fourth conduit is subdivided to provide a separate working fluid within each of said separate sections of said chamber.

Claim 18 (Original): The apparatus according to Claim 1, wherein at least one of said heating assembly and said cooling assembly comprises at least one of quartz, alumina, sapphire, aluminum, carbon, silicon carbide, and silicon nitride.

Claim 19 (Original): The apparatus according to Claim 1, wherein said heating assembly comprises aluminum.

Claim 20 (Currently Amended): A thermal processing apparatus comprising:

a heating assembly adapted to support a wafer for processing;

a cooling assembly;

~~located such that a thermal conductance region is provided~~ a gap disposed between said heating assembly and said cooling assembly, said gap having a cross-section profile with

a first vertical dimension in a first region that is substantially different than a second vertical dimension in a second region; and

means for adjusting a thermal conductance of said ~~thermal conductance region gap~~.

Claim 21 (Currently Amended): The apparatus according to Claim 20, wherein said means for adjusting the thermal conductance of said ~~thermal conductance region gap~~ comprises a body having a recess configured to define at least a portion of a chamber configured to receive a working fluid, and means for adjusting at least one of a pressure and a density of working fluid present within said chamber.

Claim 22 (Original): The apparatus according to Claim 20, wherein at least one of said heating assembly and said cooling assembly comprises at least one of quartz, alumina, sapphire, aluminum, carbon, silicon carbide, and silicon nitride.

Claim 23 (Original): The apparatus according to Claim 20, wherein said heating assembly comprises aluminum.

Claim 24 (Currently Amended): A thermal processing apparatus comprising:
a cooling assembly adapted to support a wafer for processing;
a heating assembly located such that a ~~thermal conductance region gap~~ having a cross-section profile with a first vertical dimension in a first region that is substantially different than a second vertical dimension in a second region is provided between said heating assembly and said cooling assembly; and
a device configured to adjust a thermal conductance of said ~~thermal conductance region gap~~.

Claim 25 (Original): The apparatus according to Claim 24, wherein said device comprises a body having a recess configured to define at least a portion of a chamber configured to receive a working fluid, and a fluid injection system configured to inject a working fluid within said chamber.

Claim 26 (Original): The apparatus according to Claim 24, wherein said device comprises a driving device configured to adjust a distance between said heating assembly and said cooling assembly.

Claim 27 (Original): The apparatus according to Claim 24, wherein at least one of said heating assembly and said cooling assembly comprises at least one of quartz, alumina, sapphire, aluminum, carbon, silicon carbide, and silicon nitride.

Claim 28 (Original): The apparatus according to Claim 24, wherein said heating assembly comprises aluminum.

Claim 29 (Currently Amended): A thermal processing apparatus comprising:
a cooling assembly adapted to support a wafer for processing;
a heating assembly located such that a ~~thermal conductance region gap~~ having a cross-section profile with a first vertical dimension in a first region that is substantially different than a second vertical dimension in a second region is provided between said heating assembly and said cooling assembly; and
means for adjusting a thermal conductance of said ~~thermal conductance region gap~~.

Claim 30 (Currently Amended): The apparatus according to Claim 29, wherein said means for adjusting the thermal conductance of said ~~thermal conductance region~~ gap comprises a body having a recess configured to define at least a portion of a chamber configured to receive a working fluid, and means for adjusting at least one of a pressure and a density of working fluid present within said chamber.

Claim 31 (Original): The apparatus according to Claim 29, wherein at least one of said heating assembly and said cooling assembly comprises at least one of quartz, alumina, sapphire, aluminum, carbon, silicon carbide, and silicon nitride.

Claim 32 (Original): The apparatus according to Claim 29, wherein said cooling assembly comprises aluminum.

Claims 33-42 (Canceled).

Claim 43 (New): A thermal process comprising:
a heating assembly adapted to support a wafer for processing;
a cooling assembly located such that a thermal conductance region is provided between said heating assembly and said cooling assembly and
a device configured to adjust a thermal conductance of said thermal conductance region;

wherein said device comprises a body having a recess with a membrane therein defining separate sections within a chamber configured to receive a working fluid, and a fluid injection system configured to inject a working fluid within said chamber.

Claim 44 (New): The apparatus according to Claim 43, wherein said membrane is in a form of a honeycomb.

Claim 45 (New): The apparatus according to Claim 43, wherein said membrane is in a form of ribs.

Claim 46 (New): A thermal processing apparatus comprising:
a heating assembly adapted to support a wafer for processing;
a cooling assembly;
a gap disposed between said heating assembly and said cooling assembly, said gap having a cross-section profile with a first vertical dimension in a first region that is substantially different than a vertical dimension in a second region; and
a device configured to adjust a thermal conductance of said gap,
wherein said device comprises a body having a recess platinum coated recess configured to define at least a portion of a chamber configured to receive a working fluid, and a fluid injection system configured to inject a working fluid within said chamber.

Claim 47 (New): A thermal process comprising:
a heating assembly adapted to support a wafer for processing;
a cooling assembly located such that a thermal conductance region is provided between said heating assembly and said cooling assembly and
a device configured to adjust a thermal conductance of said thermal conductance region;
wherein said heating assembly comprises a heating body and an electrical resistive element attached to said heating body;

said cooling assembly comprises a cooling body, a fluid path within said cooling body, and a feed device configured to feed cooling fluid along said fluid path;

said device comprises a body having a recess configured to define at least a portion of a chamber configured to receive a working fluid, and a fluid injection system configured to inject a working fluid within said chamber; and

said heating assembly and said cooling assembly are mounted on a pedestal, said pedestal having a first conduit extending therethrough and configured to receive power supply wires for said electrical resistive element, said pedestal having a second conduit extending therethrough and configured to act as a supply line for said fluid path, said pedestal having a third conduit extending therethrough and configured to act as a discharge line for said fluid path, said pedestal having a fourth conduit extending therethrough and configured to act as a feed line for said chamber.

Claim 48 (New): The apparatus according to Claim 46, wherein:

said recess has a membrane therein defining separate sections within said chamber;
and

said fourth conduit is subdivided to provide a separate working fluid within each of said separate sections of said chamber.